ECObiotix™

Non-Hazardous / Non-Corrosive
Bioremediation Agent

DISTRIBUTOR INFORMATION

Nature's pollution solution.

CETI

restoring the environment

CORNERSTONE ENVIRONMENTAL TECHNOLOGIES INCORPORATED

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CETI COMPANY INFORMATION

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COMPANY MISSION

. . . all available company resources working toward the restoration of our environment . . .

COMPANY & TECHNOLOGY OVERVIEW

CETI is an environmental solutions company dedicated to restoring the environment with our multidisciplinary and comprehensive, professional services, and offering ECOBIOTIX™ multi-patented, 100% non-hazardous products for the remediation of water, soil and other mediums polluted by industry, agricultural and urban activity.

The CETI Environmental Engineering Group satisfies the growing demand for a specialized team that has the ability to apply engineering principles to problem solving in the environmental marketplace. This team consists of individuals with technical expertise in the areas of stream restoration/relocation, water resources and watershed planning, water and wastewater treatment and reuse, point source and nonpoint source pollution prevention, and effective environmental resource management.

With benchmark field tests from more than 10 years of research and development, CETI's product technology, ECOBIOTIX™, is unmatched in both composition and effectiveness at remediating point source and nonpoint source pollution.

Until ECOBIOTIX™, available technology has not satisfactorily removed waste from the water of point source pollution sites, such as industrial plants, or provided a viable solution for nonpoint source pollution (NPS) contributors like agriculture.

ECOBIOTIX™ redefines Best Available Technology (BAT) for point source hydrocarbon and wastewater management, AND it provides a breakthrough soil remediation and pollution reduction solution for agricultural runoff, perhaps the most direct contributor of NPS.

One of the most pressing global issues today is the ongoing need for communities to have adequate supplies of fresh water, appropriate sanitation, and effective management of valuable water resources. ECOBIOTIX™ along with The CETI Environmental Engineering Group address these issues offering a unique cost effective and environmentallyfriendly solution.

The unique features and capabilities of ECOBIOTIX™ will enable these additional applications and markets to be addressed:

- HYDROCARBON REMEDIATION
- WATER REMEDIATION
- SOIL REMEDIATION
- WASTEWATER TREATMENT
- INDUSTRIAL WASTEWATER
- AGRICULTURE BIOREMEDIATION
- SLUDGE & BIOSOLIDS TREATMENT
- GROUND WATER TREATMENT
- ODOR CONTROL
- WATER SOFTENER
- CLASS A & B FIRE EXTINGUISHING

ECOBIOTIX™

THE CHALLENGE

A major problem facing our nation and the world is one of misplaced hydrocarbons. These are oils, fats, fuel and other related substances that, once they have been used, are being disposed of, often contaminating the home, workplace and the environment. A mild form of contamination would be an oil spot on your driveway, while a severe form of contamination would be an oceanic oil spill such as the Exxon Valdez or the Gulf Coast tragedy.

In the past, hydrocarbon pollution problems have primarily been transferred from one area to another for either storage or disposal. This did not result in ridding the environment of the pollutant. However, through the use of specific microbes, these pollutants can be transformed into natural occurring elements, carbon dioxides and water, which are harmless to the environment.

Microbial cleaning in its basic form is a process that has existed since the beginning of time. It is nature's way of returning a substance near to its original state. Through the use of naturally occurring microorganisms, nature has been cleaning up the environment through the ages. There are microorganisms capable of literally eating every natural substance known to man. Over the ages man has recognized the value of bacteria that nature has provided and has been using them to benefit mankind ever since.

As we use the term microbial cleaning today, it applies to the numerous and various surfaces man has contaminated with some form of pollutants. Through technology and research, man has devised methods of augmenting natures' answer to pollution in a more efficient and safe manner.

MICROBIAL REMEDIATION

Microbes are very tiny life forms. The diameter of a single microbe is approximately one micron. One needs to magnify a single microbe a thousand times, just to see it in a microscope. If a man would be magnified similarly, he would appear one mile tall. Microbes are everywhere. A billion microbes could easily occupy a space not much larger than a pinhead.

Microbes are nature's waste degraders. Naturally occurring microbes are found in our rivers, streams and soil. The slippery substance found under rocks in riverbeds are microbe colonies called biofilm. They consume the waste products in the water and thereby, clean it up. Microbes, by the billions, are present in human and animal digestive and elimination systems. Man could not exist without microbes.

Many food processes employ microbes. All fermentation utilizes microbes. Such products as cheese, buttermilk, sour cream, soy sauce, dill pickles and beer could not be made without microbes. In spite of all the good that microbes do, microbes are often associated with "germs" that are harmful. However, less than one percent of all microbes fit into this category. ECOBIOTIX™ is the highest quality microbial product on the market. Because of the scientific nature of its composition and the special care taken in preparation and packaging, ECOBIOTIX™ is certified free of any harmful microbes.

ORGANIC CONTAMINANTS

At its core, ECOBIOTIX™ is a scientific blend of multiple strains of *naturally-occurring,* active microbes capable of literally consuming organic contaminants found in the wastewater generated by industrial, commercial and residential activity, and flowpath areas like drain lines and grease traps. These strains digest organic waste such as fat, grease, oil, protein, starch, cellulose, and detergent. The blend is also synergistic, which means that all strains are compatible with each other and

compliment each other's activity. ECOBIOTIX™ has over 500 billion active microbes and enzymes per gallon of product.

ECOBIOTIX™ OVERVIEW

ECOBIOTIX™ is a breakthrough, 100% green-chemistry, bioremediation agent with a pH of 10 to 13.5 – yet it is non-corrosive. A proprietary blend of naturally occurring microbes, enzymes and emulsifiers in a nutrient-enriched biocatalyst, ECOBIOTIX™ is non-hazardous, non-irritating, non-flammable and non-pathogenic.

Composed as an aqueous-based, alkaline solution with non-ionic biosurfactants, ECOBIOTIX™ sustains 95% or greater enzymatic activity while multiplying microbes and enzymes approximately every 20 minutes in the presence of wastes that are a part of its food chain.

ECOBIOTIX™ lowers both BOD (biochemical oxygen demand) and COD (chemical oxygen demand) in agricultural, residential and industry-generated wastewater. It will simultaneously clean and colonize collection lines, sewers, septic systems or holding tanks with beneficial microorganisms and non-ionic surfactants, providing superior wetting while increasing surface area distribution of product in the context of a non-corrosive, high pH for increased cutting action.

ECOBIOTIX™ will continue to feed and clean downstream, eliminating oil, grease, soaps, gasoline and other petroleum products along the way. With ECOBIOTIX™ caustic chemicals that compromise system functions and threaten treatment facilities with future liabilities are no longer needed.

ECOBIOTIX™ mitigates hydrogen sulfide, a highly corrosive gas emission, which is a major source of stench in degraded waste. In extreme hot or cold water temperatures, ECOBIOTIX™ not only effectively achieves odor reduction, it acts as a water softener by breaking down heavy metal adhesion. This helps prevent scale build-up, thereby improving the performance of systems during operation and lowering operating costs by extending the useful life of their components over the long run.

ECOBIOTIX™ redefines Best Available Technology (BAT) for wastewater management, provides a powerful solution for nonpoint pollution sources like agriculture, and, in addition to its superior cleaning capabilities, delivers a true environmentally minded product for janitorial services within industrial and commercial venues.

Finally, ECOBIOTIX™ ships as a convenient, ready-to-use liquid and is formulated and manufactured according to all 12 guidelines for green manufacturing. Neither the product nor the production process produces any toxic or hazardous waste.

Truly, ECOBIOTIX™ bridges a gap between humanity's desire to act responsibly and our ability to remediate damages to our earth's environment.

ECOBIOTIX™ PRODUCT TECHNOLOGY

A proactive technology, ECOBIOTIX™ breaks the molecular bond between pollutants (i.e., minerals, chemicals, nutrients, hydrocarbons) and the oxygen molecule in water, reducing and digesting organic waste, and allowing easier sifting of simplified hydrocarbons and non-organic waste for mechanical collection. In short, product technology increases the nitrogen cycle, aids in decomposition of hydrocarbons and converts ammonia to nitrates.

- **MICROBES:** ECOBIOTIX™ microbes are a blend of multiple strains that break up the hydrocarbon chain. Activated by water, and accelerated by the proprietary, aqueous biocatalyst, these aerobic and anaerobic microorganisms thrive on hydrocarbons and organic waste, multiplying approximately every 20 minutes until the food source is depleted, whereupon they become dormant until reactivated by further nutrients.

ECOBIOTIX™ microbes are extremely resilient, maintaining their effectiveness in neutral to alkaline pH ranges and excessively hot or cold water temperatures.

- **ENZYMES:** Sustaining 95% or greater enzymatic activity, ECOBIOTIX™ enzymes dissolve oil and grease and accelerate the decomposition of organic materials. These enzymes break down macromolecules such as proteins, starches and fats into smaller molecules so they can be readily washed away by detergents and/or water.

- **EMULSIFIER:** When hydrated, the emulsifier breaks down oil at the molecular level of the oil/water interface, decreasing surface tension and thereby aiding in the distribution of product across the target area so the enzymes and microbes can work more effectively. It also causes the biomass to expand, which brings the oil into greater contact with the natural microbes already present in soil and water. This action also dilutes the hydrocarbon contamination, thereby accelerating the remediation process.

- **BIOCATALYST:** The biocatalyst – a mixture of ingredients essential to microbial life – dramatically accelerates microbial reproduction, increasing the concentration of ECOBIOTIX™ oil-eating microbes across the target zone while stimulating the natural microbes in the surrounding area.

12 PRINCIPLES OF GREEN CHEMISTRY

ECOBIOTIX™ is manufactured according to all 12 Principles of Green Chemistry, ensuring that neither the manufacturing nor use of ECOBIOTIX™ introduces any harmful chemicals into the environment. This, combined with the breakthrough power of its composition, makes ECOBIOTIX™ not only 100% green and harmless to the environment, but proactively beneficial.

1. **PREVENTION:** ECOBIOTIX™ is a biocatalyst that metabolizes and hydrolyzes waste, rather than simply transferring it to another location. Due to microbial and enzymatic composition, during cleaning ECOBIOTIX™ also colonizes the flow-path which creates a food-chain design against future contamination. A superior cleaner, ECOBIOTIX™ leaves no residue.
2. **DESIGN SAFER CHEMICALS AND PRODUCTS:** ECOBIOTIX™ is a combination of naturally occurring microbes that degrade hydrocarbons and produce viable enzymes. Enzymes are proteins and proteins are biopolymers. ECOBIOTIX™, an alkaline solution with non-ionic biosurfactants, 95% enzymatic activity and high pH stability, provides a neutral and environmentally beneficial agent that is non-corrosive, non-flammable, non-irritating and non-pathogenic.
3. **DESIGN LESS HAZARDOUS CHEMICAL SYNTHESIS:** ECOBIOTIX™ is designed to improve cleaning performance under adverse conditions such as extreme temperatures or high alkalinity, while maintaining high enzymatic stability and efficiency. ECOBIOTIX™ also minimizes and/or eliminates toxic by-products through efficient chemical reaction.
4. **USE RENEWABLE FEEDSTOCKS:** ECOBIOTIX™ is not the product of depleting feedstocks that are made from fossil fuels such as petroleum, natural gas or coal (which is mined). Renewable feedstocks are the product of a food chain that creates and eliminates waste symbiotically in order to safely biodegrade potential toxins. The microbes and enzymes of ECOBIOTIX™ are characterized by the biochemical reactions that they catalyze for the degradation of biological substances.
5. **USE CATALYSTS AND NOT STOICHIOMETRIC REAGENTS**: ECOBIOTIX™ is created in a composition that is an aqueous-based solution for the cleaning, digesting and degrading of organic compounds and is specifically designed to be environmentally friendly. ECOBIOTIX™ contains naturally occurring and viable microorganisms that catalyze the hydrolysis of the peptide bond in proteins and catalyze the hydrolysis of

ester bonds in fats. They reproduce approximately every 20 minutes and are both aerobic and anaerobic and degrade hydrocarbons.

6. **AVOID CHEMICAL DERIVATIVES:** ECOBIOTIX™ by design is a unique and patented water and alkaline-based cleaner that is a combination of stabilized enzymes, microbes and biosurfactants, with water being a carrier.
7. **USE SAFER SOLVENTS AND REACTION CONDITIONS:** ECOBIOTIX™ completely replaces both hazardous and corrosive acid or alkaline baths and hazardous, flammable aliphatics and aromatic solvents used to remove hydrocarbons. ECOBIOTIX™ is extremely safe to handle and poses no hazardous risks.
8. **MAXIMIZE ATOM ECONOMY:** ECOBIOTIX™ by design ensures that the final product contains the maximum proportion of the starting materials that it contributes. Its microbes reproduce or double in mass approximately every 20 minutes while degrading the waste that it is applied to. As waste matter is consumed or degraded, its mass decreases while the ECOBIOTIX™ biomass increases exponentially and is also reusable.
9. **INCREASE ENERGY EFFICIENCY:** ECOBIOTIX™ will generate chemical reactions in ambient temperature and pressure settings. Temperature does not have to be extremely high or low to generate desired results, and ECOBIOTIX™ eliminates the need for sandblasting or incineration of spent hydrocarbons.
10. **DESIGN CHEMICALS AND PRODUCTS TO DEGRADE AFTER USE:** ECOBIOTIX™, when not feeding on waste in a given flow-path, has microorganisms that will go dormant, with the bulk of the remaining composition being water.
11. **ANALYZE IN REAL TIME TO PRESENT POLLUTION:** CETI has the capability to implement process analytical technology for real-time *in-situ*, green chemistry analysis testing and complex catalytic reactions. Implementing a universal reaction analysis tool in process research and development is a turnkey advantage and offering.
12. **MINIMIZE THE POTENTIAL FOR ACCIDENTS:** ECOBIOTIX™, because of its benign nature and composition, gives all managers and supervisors who bear direct responsibility for the health of each employee or stakeholder under their direction a best available technology (BAT) that is completely safe to use.

ECOBIOTIX™

SUGGESTED USES

Industrial Applications
- Automotive Manufacturing
- Steel Process, Refineries
- Ships and Ship Yards
    - Surface cleaner
    - Bilge maintenance
- Aircraft Carriers
    - Oil and fuel cleanup
    - Fire extinguishing solution
    - Anti-flammability agent
    - Kitchen cleanser
    - Janitorial maintenance
- Automotive Repair
    - Oil remediation
    - Parts degreaser
    - Hand degreaser
- Parts Washers
    - Caustic bath replacement
- Wastewater pre-treatment process
- Wastewater post-treatment process
    - Mining
    - Natural gas drilling
- Commercial Janitorial
- Environmental Companies
    - Contaminated Soil Remediation Services
    - Contaminated Water Remediation Services

Agricultural
- Soil remediation
- Gypsy Moth control
- Drainage, direct and diffuse

Food Preparation Facilities
- Homes, Cafeterias, Prisons, Hospitals, Grocery Stores, Restaurants
    - Kitchen Floors
    - Cleaning Tables
    - Wiping down stoves and oven hoods
    - Keeping drain lines clear
    - Keeping grease traps clear and free flowing
    - Keeping septic systems clear and free flowing

Household
- Automotive Engines
- Lawn Mower
- Driveway
- Washing hands
- Washing parts
- Septic Systems
- Carpet cleaner for blood, ink, juice stains and gum
- Effectively cleans kitchen appliances, sinks, granite counters and cutting boards

ECOBIOTIX™

OIL SPECIFIC USES

PARKING LOTS: New laws under consideration will require a holding tank capacity for impounding five minutes of rainwater runoff. ECOBIOTIX will remediate areas of oil contamination and largely prevent buildup of oil-based waste in holding tanks.

RESTAURANTS: ECOBIOTIX can be used in food service establishments to clean and treat floors in kitchens and associated dining areas.

GREASE TRAPS: ECOBIOTIX is the highest quality microbial product on the market. It is a scientific blend of multiple strains of naturally occurring active microbes, which are capable of literally consuming the organic contaminants that clog drain lines and fill grease traps. These strains digest organic waste such as fat, grease, oil, protein, starch, cellulose and detergent. The blend is synergistic, which means all strains are compatible with each other and compliment each other's activity. ECOBIOTIX has over 500 billion active microbes per gallon of product.

OIL SPILL EQUIPMENT: By spraying the oil absorbent material used with oil spill booms, sox and pads, ECOBIOTIX will remove the hydrocarbons, and allow the booms to be reused. Prior to this, the oil contaminated material had to be disposed of as toxic waste.

FIRE DEPARTMENT: By spraying the product on gasoline and diesel spills prior to washing them with water, cleanup time is reduced, and when the product is washed into the ditches it will be bioremediated. Another important benefit to fire departments is where once applied with ECOBIOTIX the contaminated area becomes much less flammable.

AIRPORTS: Runways and tarmacs contaminated with spills of oil and fuels can be easily cleaned.

SHOP FLOORS: Any floor in a machine shop type environment that has been exposed to cutting oils and equipment lubrication can be completely cleaned using this process.

SERVICE STATIONS: Work bay areas can be cleaned and kept clean with this process. Other methods do no more than spread the oil in a thin layer over the complete floor area. This does not clean up the oil and actually produces a safety hazard due to extremely slick floors.

PARTS CLEANER: When it is desirous to degrease parts, this process can be employed. It produces totally oil free parts and is not harmful to the skin (like other solvent cleaners).

SHOP RAGS: Shop rags can be washed in the parts cleaner, wrung out, hung over a line and used the next day. No solvent odors remain and the rags can be used over and over.

DIP VATS: Machine shops, auto shops, etc. can use ECOBIOTIX in their dip vats to remove oil from parts that need painting or plating. It will replace many "hot caustic" dips, saving money on electricity and eliminating toxic waste problems associated with the "hot caustic" dip method.

SOIL: Determine the type or amount of contamination by lab tests. Determine the presence of other contaminants harmful to the bacteria by lab tests. Plow or till the soil to the depth of contamination or remove the soil and spread it 12 to 18 inches deep. Spray the biocatalyst solution onto the soil at an approximate rate of 1/3 gallon per cubic yard of soil. Test every 28 days to determine bioremediation process results.

TANK CLEANING: ECOBIOTIX can be used by oil companies to help increase safety and efficiency in the removal of sludge from large above ground tanks and the removal of gasoline and diesel from tank trucks.

OTHER AREAS: Car Dealerships, Schools, Municipalities Garages and Shops, Pipeline Companies, Oil Field Service Companies, Transport Carriers, Freight Lines, Utility Districts, Hospitals, Body Shops, Truck and Car Washes.

ECOBIOTIX™

HYDROCARBON APPLICATION LIST

ECOBIOTIX™ effectively remediates the following hydrocarbons:

Acetone
Acetonitrile
Amylacetate

Benzene
Butanol
Bromodichloromethane
Bromoform
Bunker C
2-Butanol

Canola Oil
Carbon Disulfide
Carbon Tetrachloride
Chloroform
Chloromethane
Chlorobenzene
Corn Oil
Cutting Oils
Cyclohexane

Dichlormethane
Dichlorbenzene
1.2-Dichloroethane
Diesel Fuels
Dfm2

Ethanol
Ether
Ethyl
Ethylbenzene
Ethylene Glycol

Gasoline

Heavy Bunker Oil
Heptane
Hexachlorobenzene
Hexade
Hexene

Intermediate Fuel Oil
Isbutanol
Isoprene

Jet Fuel

Kerosene

Mdo
Methanol
Methylene Chloride

Methylene Ketone

Methylphenol
Motor Oil

Naphthanlene
2-Nitoranaline
Nitrobenzene

Oil Based Fluids

Oil Based Ink
Oil Based Paints

Paraffin Oil
Pentane
Pentachlorophenol
Phenol
Propanol

Scintillation Liquid
Silicon Oils
Styrene

Tetrachloride
Tetrachloroethane
Tetrachloroethyene
Tetrahydrofuran
Toluene
Trichloroethylene

Trichlorophenol

Varsol
Vinyl Acetate
Vinyl Chloride

Xylene

POINT SOURCE & NONPOINT SOURCE POLUTION

From the increased difficulty in managing industrial waste to the reality of agricultural and urban runoff, water pollution is a growing concern. Until now, available technology has not satisfactorily removed waste from the water. So most of our actions have been reactions focused on treating the problems caused by pollution versus reducing its various source points.

A cost-effective, break-through technology through Green Chemistry, ECOBIOTIX™ can considerably strengthen proactive conservation efforts by addressing both point source and nonpoint source pollution. Its multi-tiered structuring extends the effectiveness of ECOBIOTIX into every industry where wastewater occurs to assist with not only reducing the amount of harmful pollutants being introduced into the environment, but also with the remediation of pre-existing contaminants.

POINT SOURCE POLLUTION

Industrial Wastewater

- Industrial process waters
- Industrial cooling waters (from biocides, heat, slimes, silt)
- Industrial site drainage (from silt, sand, alkali, oil, chemical residues)
- Organic or biodegradable waste (including waste from slaughterhouses, creameries and ice cream manufacturing)
- Organic or non biodegradable/difficult-to-treat waste (from pharmaceutical or pesticidal manufacturing)
- Extreme pH waste (from acid/alkali manufacturing, metal plating)
- Toxic waste (from metal plating, cyanide production, pesticide manufacturing, etc.)
- Solids and Emulsions (from paper manufacturing, foodstuffs, lubricating and hydraulic oil manufacturing, etc.)

Sludge & Biosolids

- Human waste (from fæces, urine, or other bodily fluids - usually from lavatories), also known as blackwater (slurries biosolids)
- Cesspit leakage
- Septic tank discharge
- Sewage treatment plant discharge
- Washing water (from clothes, floors, dishes, etc.), also known as greywater or sullage

Drainlines & Grease Traps

Generally, there are three (3) basic types of additives that are used to clean and maintain drain lines and grease traps. These are: Chemicals, Enzymes, and Microbes.

1. Chemicals are either acids or alkalis. They function by producing a chemical reaction, which generates heat. This strong thermal effect tends to melt solid fats and greases at the point of a clog. Frequently the clog is cleared, but the fats and greases are deposited in more distant parts of the drain system where future problems might arise. In addition, chemicals tend to erode the pipes and fittings of the drain line, eventually causing leaks and necessitating expensive repairs. In many areas of the country, the use of chemicals is prohibited because they are strong pollutants of the waste water system. Their use also allows some of the melted oil and grease to enter the public system. This practice is prohibited in many areas and may result in fines.

2. Enzymes are organic catalysts that cause oils and greases to dissolve. When used regularly in a drain system, the dissolved oils and greases are allowed to move into the public drain lines and eventually into the waste water treatment plants. In many areas the use of enzymes is prohibited as the polluting oils and greases are still present in the wastewater. Enzymes are totally used up in a short time and must be added frequently to be effective. There is also a possibility that oil and grease contaminants will be deposited in harder to reach areas of the drain system.

3. Microbes are living organisms, which consume oils, greases and other organic contaminants in a drain system and convert them into non-polluting, harmless substances. Microbes do this by generating specific enzymes in the kind of quantities that render a particular food source digestible. The microbes then absorb the dissolved food source. The result is the increase in the number of microbes, as they do not grow in size but multiply by a system called cell division. For example, when ECOBIOTIX is added to the drain system, the number of microbes double approximately every twenty minutes until the food source is depleted, at which time they become dormant. The microbes then remain in the drain line creating a coating that acts as a shield to help address future contaminants.

Solution – ECOBIOTIX™

- Lowers BOD (biochemical oxygen demand): the measure of oxygen demand caused by biodegradable pollutants
- Lowers COD (chemical oxygen demand): the measure of oxygen demand caused by oxidizable pollutants
- Reduces TSS (total suspended solids)
- Reduces hydrocarbons: oils, grease, fats, fuels
- Separates metals (breaks down heavy metal adhesion). This helps prevent scale build-up, thereby improving the performance of systems during operations and lowering operating costs by extending the useful life of their components over the long run.
- Slurries biosolids
- Contols oder: mitigates hydrogen sulfide, a highly corrosive gas emission, which is a major source of stench in degraded waste

NONPOINT SOURCE POLLUTION

Nonpoint source pollution (NPS), unlike pollution from point sources such as industrial and sewage treatment plants, comes from many diffuse sources. Polluted runoff is caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into watersheds through lakes, rivers, wetlands, coastal waters, and even our underground sources of drinking water.

The United States has more than 330 million acres of agricultural land that produce an abundant supply of food and other products. In the 2000 National Water Quality Inventory, states reported that agricultural NPS is the leading source of water quality impacts on surveyed rivers and lakes, the second largest source of impairments to wetlands, and a major contributor to contamination of surveyed estuaries and ground water.

Agricultural pollutants that result from these activities are sediment, nutrients, pathogens, pesticides, metals, and salts. Agricultural impacts on surface water and ground water can be minimized by using management practices that are customized for local conditions. Many practices designed to reduce pollution also save producers money in the long run.

Agricultural Drainage

- Direct
- Diffuse

Solution – ECOBIOTIX™

- Remediates harmful pollutants applied to soil
- Balances soil pH
- Increases the nitrogen cycle
- Converts ammonia to nitrates
- Lowers operating costs
- Rids treated areas of Gypsy Moth

ECOBIOTIX™

QUESTIONS & ANSWERS

Q: What Is ECOBIOTIX?
A: ECOBIOTIX is a ready-to-use, 100% green-chemistry industrial cleaner consisting of naturally occurring, hydrocarbon-ingesting microbes, enzymes and emulsifiers in an oxygenating, water-soluble biocatalyst. It has an unusually high pH yet is non-corrosive, non-caustic, and completely safe to handle.

Q: How is ECOBIOTIX applied?
A: The liquid consistency of ECOBIOTIX is such that it allows pouring or misting through various spray applicators.

Q: Is ECOBIOTIX dangerous?
A: No. It is non-toxic, non-pathogenic and is completely harmless to human, plant, animal and marine life when used properly. (Please see MSDS sheet.)

Q: What is ECOBIOTIX used for?
A: ECOBIOTIX provides a powerful solution for multiple targets: wastewater remediation, hydrocarbon remediation (anywhere grease, oil or fuel is a problem), odor elimination, industrial and commercial cleaning needs.

Q: What makes ECOBIOTIX different from other products?
A: ECOBIOTIX has an unusually high pH, yet is non-hazardous, safe for both the environment and user. Further, it not only cleans effectively, it removes hydrocarbons from the environment; whereas soaps, solvents, alkaline and acid baths add harmful ingredients to the environment.

Q: What's the difference between a microbe and an enzyme?
A: A microbe is a living organism that eats and reproduces. An enzyme is an organic catalyst, which certain microbes produce.

Q: Why does ECOBIOTIX contain both microbes and enzymes?
A: Enzymes acting alone only break down oil without actually eliminating it at the molecular level. Therefore, treatment with enzymes alone only moves the problem from one area to another without remediation of any kind. Microbes help to remove the hydrocarbons by eating and digesting oil, leaving only harmless by-products without causing any problems down stream. Many commercial drain cleaners, for example, contain enzymes that are neither bio remediating nor safe to humans. Enzymes help break down the oil, which enables the microbes to work more quickly and efficiently.

Q: When remediating soil, how do I know ECOBIOTIX is working?
A: In most cases where oil contamination occurs, plant life will cease to grow. It has been our experience that grass and weeds will usually begin to grow in an area treated with ECOBIOTIX within a few weeks.

Q: How long does ECOBIOTIX last?
A: ECOBIOTIX has an extremely stable shelf life. Products stored under normal conditions (room temperature, and within their closed container) for two years have shown no loss of efficacy.

Q: Can I dilute ECOBIOTIX with water?
A: Yes. However, it is best to use ECOBIOTIX full strength for the first application. After that, use whatever dilution rate will still do the job.

Q: Will ECOBIOTIX work if I don't scrub the surface?

A: ECOBIOTIX will remediate oil in dirt by simply applying and mixing it with the soil. However, when cleaning a surface, it is necessary to break up the oil and dirt. The more thorough the agitation the better it will clean.

Q: Why must I keep ECOBIOTIX wet?
A: As an aqueous based solution, ECOBIOTIX is most effective when kept damp.

Q: I have a grease trap that has just been cleaned. How much ECOBIOTIX do I need to use to keep it clean?
A: For every 500 gallons of grease trap capacity, apply one gallon of ECOBIOTIX diluted with four gallons of water over a period of a month. Also, keep in mind that ECOBIOTIX will only eat the fats, oils and greases in the trap, not the dirt that can build up.

Q: Can ECOBIOTIX be used on an oil spill?
A: Yes. In an emergency release, spray one gallon of activated ECOBIOTIX per every five gallons of oil on the surface. Agitate the area to mix in the biocatalyst, then spray a liberal amount of water on the surface and agitate again. This being done, collect the spill and contain it until the bugs have had a chance to eat the oil. Be sure the area remains wet, or else the bugs will stop working.

Q: I know ECOBIOTIX works on concrete floors, but what about linoleum?
A: ECOBIOTIX works well on any surface. On linoleum, use it the same as you would for concrete, except use a mop to apply it to help prevent scratching. Also, keep in mind that ECOBIOTIX, when used full strength, will strip the wax off flooring.

Q: What testing or studies have been done?
A: ECOBIOTIX has been in R&D for 10 years and has undergone numerous tests and field studies. EPA testing is currently in process. Please see MSDS and spec sheets.

Q: How is the product shipped?
A: Currently, ECOBIOTIX is available in quart, gallon, five gallon, 55 gallon drums and totes (palates of four to five 55-gallon drums).

Q: What is the cost?
A: Cost is based on quantity and formulation. Please contact a CETI field specialist for specific pricing.

Q: What is the current production capacity?
A: The plant is capable of producing 3,245,000 gallons per week: 59,000, 55 gallon drums.

ECOBIOTIX™

APPLICATION EXAMPLES

MARINE INDUSTRY

Spilled oil, greases, gasoline and diesel fuel are all serious problems for water going vessels. These misplaced hydrocarbons make their way into the craft's bilge thus causing dangerous fumes and/or highly contaminated bilge contents that must be then handled as hazardous waste.

ECOBIOTIX™ microbial cleaning solution should be used during daily maintenance of the craft's deck, booms, galley, engine room and bilge to control the accumulation of unwanted hydrocarbon fumes and substance. This modern solution is specifically designed to rapidly breakdown hydrocarbon into micells to allow the hydrocarbon-consuming microbes, present in the solution, to feast on this food supply.

- **DECK:** Decks, from the smallest pleasure craft to the largest ocean going vessel, can benefit from daily usage of ECOBIOTIX™ cleaner on the deck surface, thus reducing the risk of falling due to slippery areas caused by the presence of hydrocarbons. Daily mopping with ECOBIOTIX™ solution will help prevent this situation.
- **GALLEY:** ECOBIOTIX™ is an excellent solution to utilize in the galley area to clean greasy floors, wastewater, drains, and wipe down ovens and oven hoods. The used water and cleaning solution should be deposited in the vessel bilge or holding tanks thus adding more microbes to the wastewater clean-up challenge.
- **ENGINE ROOM/COMPARTMENT:** Floors, floor grates, handrails, engines, tools are all candidates for utilizing ECOBIOTIX™ solution for oil and greasy clean up.
- **BILGE:** For the vessels with an open bilge, the ECOBIOTIX™ solution, used as directed, can help eliminate the volatile VOC from the bilge. Also, the microbes will consume any hydrocarbons present in the bilge water thus making it less expensive to dispose of in port. Routine use of ECOBIOTIX™ in the vessel's wastewater holding tanks will also help ensure lower levels of hydrocarbon presence when the tanks are emptied at port. The use of ECOBIOTIX™ in the vessel's bilge system should never be considered a complete cure all for hazardous waste removal, however, it will reduce the requirements of handling hydrocarbon contaminated bilge water as hazardous wastewater due to the microbes reducing the hydrocarbon levels to acceptable limits. It is the responsibility of the vessel owner to dispose of bilge water treated with ECOBIOTIX™ in accordance with local laws and regulations.

SEPTIC SYSTEMS

ECOBIOTIX™ is an excellent product to solve many of the problems with improper operating septic systems. Typically there are two main reasons septic systems do not function properly, assuming proper installation has occurred. These are:

1. The feed lines and/or the drain lines have become clogged with roots from nearby trees or shrubbery. (ECOBIOTIX™ cannot help with this.)
2. The drain lines and/or the tank have become congested with solid waste materials bonded with hydrocarbons blocking the free flow of fluids. The natural microbes in ECOBIOTIX™ slurry the bio-solids of human waste and feed on the hydrocarbons.

Septic systems are dependent upon the working of natural microbial colonies for biodegradation and bio-remediation of the solid waste materials turning it into fluids which then drain from the lines into the drain fields. These natural microbes consume the solid human waste but are not of the microbe strain

that feed on hydrocarbons. The hydrocarbons that enter your septic systems typically come from the kitchen sink, garbage disposal and dishwater or from the sink, where oily hands are washed.

Application requirements of ECOBIOTIX™ will vary depending on the current condition of the septic system; the two extremes are listed below. However using good judgment with the conditions in between these two extremes is required.

1. Newly Installed Septic System – This is absolutely the best time to begin using ECOBIOTIX™ on a routine schedule. In this situation applying one cup of ECOBIOTIX™ down your kitchen sink and flushing with warm water on a routine, weekly basis will virtually ensure that hydrocarbon build up will not occur in your system. If there is a mechanic or someone else washing oily hands in another sink, then ECOBIOTIX™ should be poured down that drain as well.

2. Completely Clogged System – Having the septic tanks pumped out and then using ECOBIOTIX™ as described above is likely the best remedy. If this approach is taken, after pumping has been completed, mix one gallon of ECOBIOTIX™ with four gallons of water and add directly into the open septic tank making sure solution comes in contact with the sides of the tank. This will allow the ECOBIOTIX™ solution to begin immediately breaking down the hydrocarbons so the microbes can attach themselves and begin the remediation process.

CONCRETE CLEANING

1. Lightly spray ECOBIOTIX™ over the contaminated area.
2. Take a stiff bristled brush and scrub the contaminated area for approximately one to two minutes. This action is to break up dirt and other particles that the oil has attached itself to.
3. Lightly spray the contaminated area with water and scrub for another one to two minutes.
4. Allow area to set approximately 30 minutes and then rinse with fresh water.
5. When addressing a stained area, lightly spray the area with ECOBIOTIX™ and keep the area wet overnight. If oil has penetrated the concrete, the microbes will follow it into the concrete and continue the remediation process.

NOTE

The application of ECOBIOTIX™ is the same for a spot or a large area. Remember, ECOBIOTIX™ is designed to remove oil and many foreign stains. Discoloration may remain to some degree, but the oil will be gone.

EQUIPMENT & ENGINE CLEANER

1. Allow the engine to cool to touch for personal safety considerations.
2. Lightly spray ECOBIOTIX™ over the greasy/oily areas of the equipment or engine.
3. Take a medium bristled brush and gently scrub the contaminated area for one to two minutes. This breaks up the dirt and grime mixed in with the oil.
4. Spray lightly with water and again scrub the contaminated area for one to two minutes.
5. Allow the treated area to set for approximately 20-30 minutes and then rinse with tap water.

NOTE

ECOBIOTIX™ will not harm the electrical wiring or hoses of your engine.

SOIL TREATMENT

1. Determine the type and amount of contamination by lab tests.
2. Determine the presence of other contaminates harmful to the bacteria by lab tests.
3. Plow or till the soil to the depth of contamination, or remove.
4. Spray ECOBIOTIX™ onto the soil at an approximate rate 1/3 gallon per cubic yard of soil 12 to 18 inches deep. Repeat on days three (3) and ten (10).

5. Spray water onto the soil until a water saturation of 30-60% is reached.
6. Maintain this saturation percentage and till or turn the soil at days three (3) and ten (10), then every seven (7) days until day 28.
7. At the end of 28 days, test the soil with EPA test 8015.
8. If needed, repeat steps five through eight until the soil reaches an acceptable level.

HYDROCARBONS IN WATER

1. Determine the type and amount of contamination by lab tests.
2. Determine the presence of other contaminants harmful to the microbes by lab tests.
3. Use approximately one gallon of ECOBIOTIX™ for every four gallons of hydrocarbons.
4. Mix the ECOBIOTIX™ solution with the hydrocarbons and water, and stir the mixture.
5. Use a pump that pulls from the bottom of the pit or pond and sprays the discharge back to the surface.
6. Use the pump to spray down the walls of the pit or the banks of the pond and allow the discharge to flow back into the pond for recycling.
7. At the end of 28 days use EPA test 8015 to test for hydrocarbons. If acceptable levels have not been reached, repeat steps four through eight until desires results are obtained.

EMERGENCY SPILLS

1. Contain all liquids.
2. Spray ECOBIOTIX™ on the contaminated area in sufficient quantity to completely cover the surface of the spill.
3. If the spill is on solid or hard surface, (i.e. concrete, asphalt, etc.) mix in with a broom and allow the spill material to mix to a milky solution.
4. Rinse away or vacuum up fluid if required by emergency spill regulations.
5. Determine the amount of hydrocarbons spilled and then add the appropriate amount of ECOBIOTIX™ to the area. See *Soil Treatment and Water Treatment* for additional information.
6. Clean brooms and related equipment with ECOBIOTIX™ and rinse with water.

GREASE TRAP MAINTENANCE

1. Have the grease trap pumped.
2. Allow the trap to fill with water.
3. Thoroughly rinse the sides of the grease trap to remove all loose particles and possible contamination.
4. Apply one gallon of ECOBIOTIX™ directly into the grease trap. On first application, spray sides of trap to begin cleaning process of walls. Let product set for approximately 10 minutes and then rinse walls with water.
5. For typical restaurants, add one gallon of ECOBIOTIX™ on a monthly basis directly into the grease trap.
6. Use ECOBIOTIX™ inside on a systematic maintenance program for washing floors, counters, hoods, vents, filters, etc. Use ECOBIOTIX™ full strength on the initial application then mix approximately one pint of ECOBIOTIX™ with one gallon of warm mop or wash water for subsequent applications. Use at least every other day.

BIOREMEDIATION

Determine the type and amount of contamination by submitting a soil sample for lab testing. If the soil is contaminated with hydrocarbons use the following method:

- Plow or till the soil. The better the job of aerating the soil, the better the efficiency of the solution.
- Spray on ECOBIOTIX™ at an approximate rate of 1/3 gallon per square yard of soil spread 12 to 18 inches deep.

- Spray on water at the rate of 30-60% of saturation. (Placing a known amount of soil in a funnel and slowly pouring water over the surface until the water begins to run out the bottom may estimate this. This will be the 100% saturation point.)
- It is not necessary to flood with water. The object is to grow microbes, not wash them away.
- The microbes will start to remediate the soil immediately and in most cases will completely break down the oil within 30-60 days. The results will be uncontaminated soil. During the remediation cycle, the by-product will be carbon dioxide, water, and fatty acids. One of the most common forms of fatty acids is a water-based hand cleaner. The fatty acid helps break down more oil as the process continues, however, this fatty acid will show up on hydrocarbon tests.
- Till or turn the soil on days three, 10, and 17 and spry with 1/3 gallon of mixed solution per cubic yard of soil at each tilling.
- On day 28 check the pH content.
- In order to actually check for all related hydrocarbons, use EPA test 8015 or 418.1.

It is not necessary to have lab tests performed in every situation. However, this is the only way to accurately gauge the effectiveness of the remediation. Many times you can simply see that it is clean. Also, clean soil will support life, so you can also plant grass and see if it will grow.

MATERIAL SAFETY DATA SHEET

SECTION I – PRODUCT IDENTITY

MANUFACTURER: CETI
P.O. Box 905
Mount Airy, MD 21771

Phone: (301) 829-8990
Emergency Phone: 1-800-424-9300
International: 001-703-527-3887

IDENTITY: ECOBIOTIX™
D.O.T: Class Not Required

FORMULA: Proprietary

HIMIS & NFPA RATING

NCPA HIMIS HAZARD RATING
Health: 1 Slight
Fire: 0 Least
Reactivity: 0 Least
Personal Protection: x (Ask Supervisor)

NFPA 704 DERIVED HAZARD RATING
Health: 1 Slight
Fire: 0 Least
Reactivity: 0 Least
Personal Protection: x (Ask Supervisor)

SECTION II – HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

HAZARD CLASSIFICATION
Ingredients: CAS #

NON-IRRITANT
Hazard Limits

- Specific chemical name(s) and CAS number(s) may be trade secret as allowed by 29 CFR 1910 1200
- All component(s) meet current TSCA inventory requirements

SECTION III – PHYSICAL AND CHEMICAL CHARACTERISTICS

Boiling Point	-	100 deg C for liquid	Evaporation Rate	-	<1
Specific Gravity	-	1.03-1.08	Melting Point	-	N/A
Percent Volatile	-	N/A	Reactivity with Water	-	N/A
Flammable Limit	-	N/A	pH	-	10.0 – 13.5
Solubility in Water	-	Soluble/Dispersible			
Odor	-	Cherry Scent			
Appearance	-	Clear Amber			

SECTION IV – FIRE AND EXPLOSION HAZARD DATA

Auto-ignite Temperature	-	N/A	Unusual Fire and Explosion Hazards	-	None
Flash Point	-	N/A	Special Fire Fighting Procedures	-	None
Minimum Ignition Temperature	-	N/A			

SECTION V – REACTIVITY DATA

Stability	-	Stable	Incompatible Substance	-	Not Known
Polymerization	-	Will not occur	Decomposition By-Product	-	Carbon Dioxide / Water

SECTION VI – HEALTH HAZARD DATA

Routes of Exposure:	Ingestion, Eye Contact
Eyes:	May cause eye irritation
Ingestion:	May be harmful if swallowed
Health Hazard, Acute and Chronic:	None established
Carsinogenicity:	N/A

Emergency First Aid Procedures:	Inhalation:	No effects expected under normal use.
	Skin or Eye:	Wash or irrigate with water 15 minutes, occasionally lifting eyelids.
	Ingestion:	If in large quantities, contact physician. Induce vomiting by giving 2 glasses of water and placing fingers down throat. Never give anything by mouth to an unconscious person.

SECTION VII – PRECAUTIONS FOR SAFE HANDLING AND STORAGE

Spill:	No special requirements.
Handling precautions	No special requirements.
Disposal procedures	In most areas may be flushed down drain with water. Consult agencies for special requirements in your area.
Storage requirements	Material should be stored in its own container and should always be kept covered.

SECTION VIII – PROTECTIVE EQUIPMENT

Respiratory Protection:	None required
Ventilation Required:	No special requirements
Local Exhaust Required:	None
Protective Clothing/Equipment:	Safety glasses/Eyewash facilities
Work Hygienic Practices:	No special requirements

SECTION IX – REGULATORY DATE

Title III-SARA:	The following data is being supplied in compliance with Title III Superfund Amendments and Reauthorizing (SARA) part 313 and A40 CFR 372. This
product	does not contain any chemicals found on the SARA list in 40 CFR 372.
Transportation:	Not regulated by D.O.T.
California Transportation:	Contains no materials known to be on the California Proposition 65 List.

SECTION X – TOXICOLOY

No data available for chronic overexposure.

DISCLAIMER

THE INFORMATION IN THIS MATERIAL SAFETY DATA SHEET IS OFFERED SOLELY FOR YOUR CONSIDERATION AND REFLECTS THE LATEST INFORMATION AND DATA THAT WE HAVE ON HAZARD, PROPERTIES AND HANDLING OF THIS PRODUCT UNDER THE RECOMMENDED CONDITIONS OF USE. RECIPIENTS ARE ADVISED TO CONFIRM IN ADVANCE OF NEED THAT THE INFORMATION IS CURRENT AND SUITABLE FOR THEIR NEEDS. THIS MATERIAL SAFETY DATA SHEET WAS PREPARED TO COMPLY WITH OSHA 24 CFR 1910.1200.